

# ABANDONED & UNCONTROLLED SITES

**NAME** \_\_\_\_\_

Griffen Pipe

Preliminary Plan of Investigation

**TOWN** \_\_\_\_\_

Council Bluffs

**DATE** \_\_\_\_\_

JAN 1990

**F.O.** \_\_\_\_\_

**PLAN OF STUDY  
FOR  
PRELIMINARY HYDROGEOLOGICAL INVESTIGATION**

**Prepared for**

**GRIFFIN PIPE PRODUCTS COMPANY  
COUNCIL BLUFFS, IOWA**

**Project No. 2045.0040**

**January 1989**

**Prepared by**

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## CHAPTER 1

### INTRODUCTION

This chapter provides a brief summary of the objective of the plan of study and general site information.

#### **Objective**

The objective of this Plan of Study is to present the procedures to be used to obtain preliminary data pertaining to the horizontal and vertical extent of soil and groundwater contamination at the Griffin Pipe Products Company facility in Council Bluffs, Iowa. Implementation of this Plan will provide data regarding the direction of groundwater flow, groundwater elevations, soil types, transmissivity, and soil and groundwater contaminant concentrations. Information garnered during this preliminary investigation will be used, if necessary, to prepare a second phase investigation which will further delineate soil and groundwater contamination and/or the feasibility of remedial action alternatives.

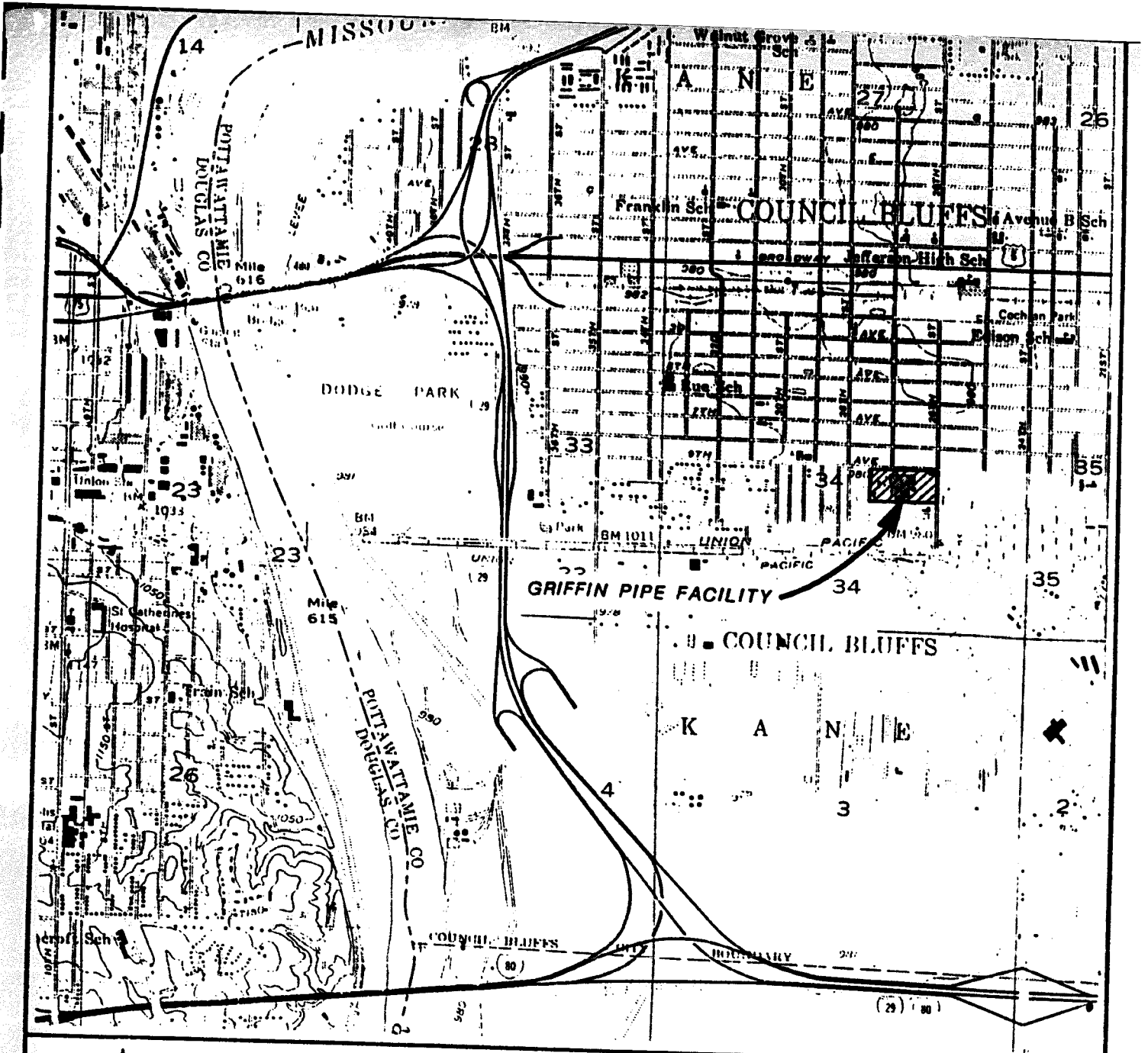
This Plan will describe guidelines for the collection and analysis of soil and groundwater samples which will evaluate the current environmental quality at the site near the excavated xylene tank. The Plan will address procedures for monitoring well installation, soil and groundwater sample collection, documentation, handling, and analysis of samples collected during the site investigation. The procedures ensure that all samples are collected in a consistent, acceptable manner which minimizes the potential for introducing outside contamination or cross-contaminating samples. The Plan will include soil identification during the advancement of each boring. This information will be used to define soil stratigraphy on the site.

#### **Background Information**

Since 1960, the facility has been known as Griffin Pipe Products Company and has manufacture cast iron water main pipes. As indicated on Figure 1-1, the facility is located at 2601 Ninth Avenue in Council Bluffs, Iowa.

An underground xylene storage tank was installed by the Griffin Pipe Products Company in 1973 and was used exclusively for xylene storage. The tank had a capacity of 550 gallons. In June, 1988, Nebraska Testing Corporation (NTC) advanced a soil boring near the xylene tank. Field samples screened by NTC using an HNU revealed a reading of 65 ppm for the soil interval of 12-13.5 feet. The tank was removed from the ground in November, 1989. During removal, it was noted there were holes in an end seam of the tank. Samples collected by NTC during tank removal revealed elevated levels of contamination.

Griffin Pipe reported the findings to the Iowa Department of Natural Resources (IDNR). James M. Montgomery, Consulting Engineers, Inc. (JMM) was subsequently retained to prepare this plan of investigation.



SOURCE:

U.S.G.S. TOPOGRAPHIC QUADRANGLES,  
 OMAHA NORTH AND OMAHA SOUTH, NEBRASKA - IOWA



GRIFFIN PIPE PRODUCTS COMPANY

**SITE LOCATION MAP**

**JAMES M. MONTGOMERY**  
 CONSULTING ENGINEERS, INC.



**DES MOINES, IOWA**

JAN., 1990

FIGURE 1-1

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## CHAPTER 2

### DRILLING PROGRAM

This chapter provides information pertaining to the number and locations of soil borings and monitoring wells, site safety, monitoring well installation and sampling procedures, and well construction details. The soil boring and monitoring well locations and depths have been chosen to provide information pertaining to the vertical and horizontal extent of contamination resulting from the possible release of xylene on the Griffin Pipe Products Company site. The former site of the xylene tank is shown in Figure 2-1.

#### **Soil Sampling**

Up to five soil borings will be advanced on the Griffin Pipe Products Company facility at the proposed locations indicated in Figure 2-2. The borings will be advanced to a depth of approximately five feet below the static groundwater level. Soil cores will be collected from the entire depth of the boring using a five-foot continuous core, split barrel sampler. Samples will be collected from the core in 2.5-foot intervals. The samples will be taken directly from the sampler and placed in clean, glass jars supplied by National Environmental Testing, Inc. (NET) located in Cedar Falls, Iowa. The sample containers will then be placed in an iced cooler to prevent or retard alteration of the chemicals in the samples. Samples collected during subfreezing conditions will be protected from freezing.

An additional sample from each interval will be collected for on-site screening by JMM personnel. The samples will be placed in Whirl-Pak™ bags, brought to room temperature, and screened using a Model 128 Organic Vapor Analyzer (OVA). The OVA detects the total volatile hydrocarbons emitted from a sample of soil in an enclosed container. The concentration of volatile hydrocarbons in each interval screened will be logged in a field log book.

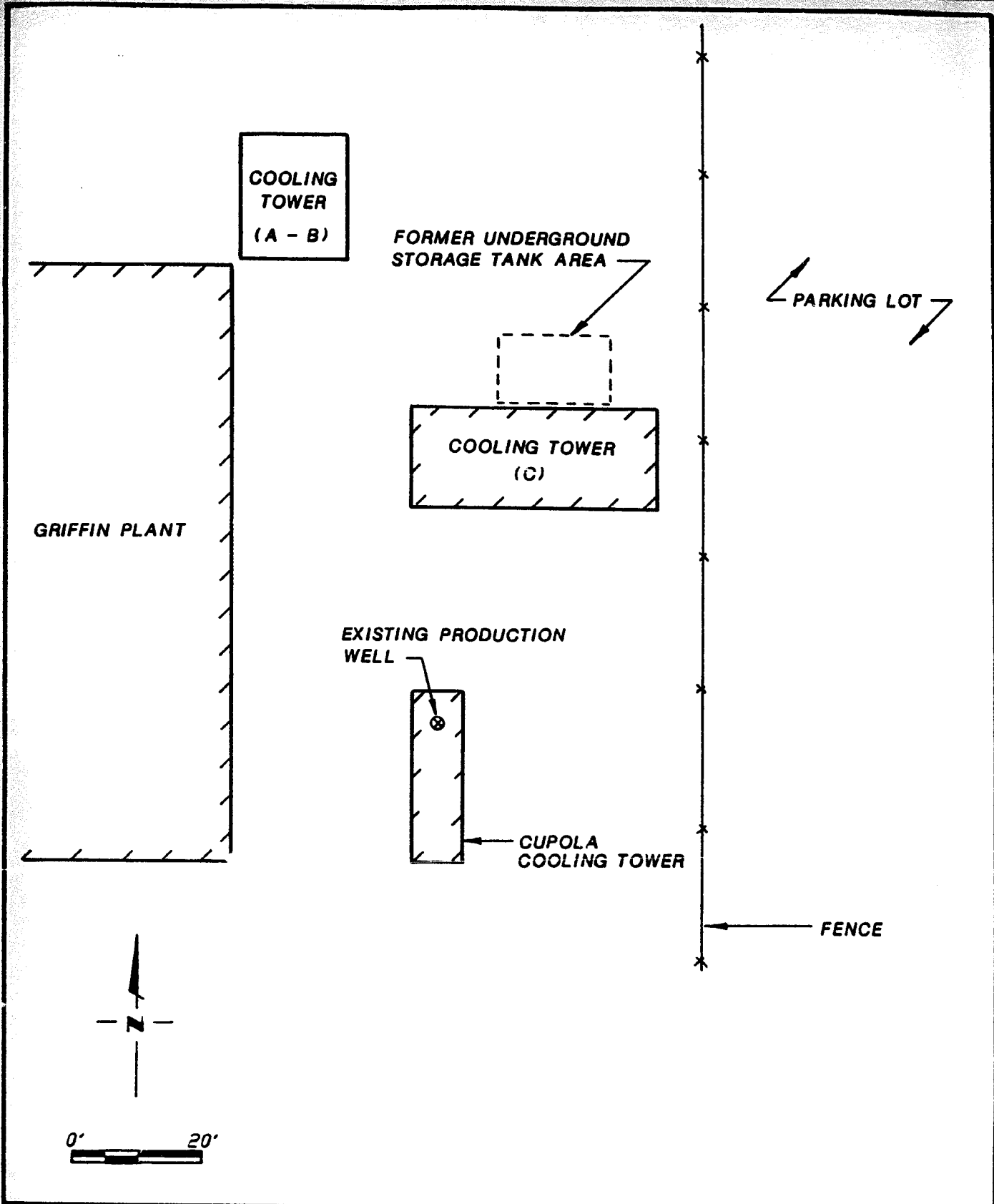
The sample interval with the highest organic vapor level from each boring, as determined by the screening process, will be submitted to NET for analysis of benzene, toluene, xylenes, ethylbenzene (BTXE) and total hydrocarbons as mineral spirits. The remaining samples will be held by JMM pending the results of the analyzed intervals and accepted sample holding times.

#### **Stratigraphy**

The stratigraphy at the site to the depth of each soil boring will be logged by JMM personnel. It is anticipated that the borings during this preliminary investigation phase will not exceed 25 feet. Each of the borings will be advanced using hollow-stem augers and a continuous core, split barrel sampler. Soil core interpretations will be documented and used to complete the boring logs.

#### **Location of Wells**

Monitoring wells will be installed in three of the five borings advanced on the Griffin Pipe Products Company property at the approximate locations shown in Figure 2-2. The monitoring wells will be identified as MW-1 through MW-3. Final well placement will be determined on site by JMM personnel based on field screening and on-site observations. Borings not developed



GRIFFIN PIPE PRODUCTS COMPANY

**SITE PLAN MAP**

**JAMES M. MONTGOMERY**  
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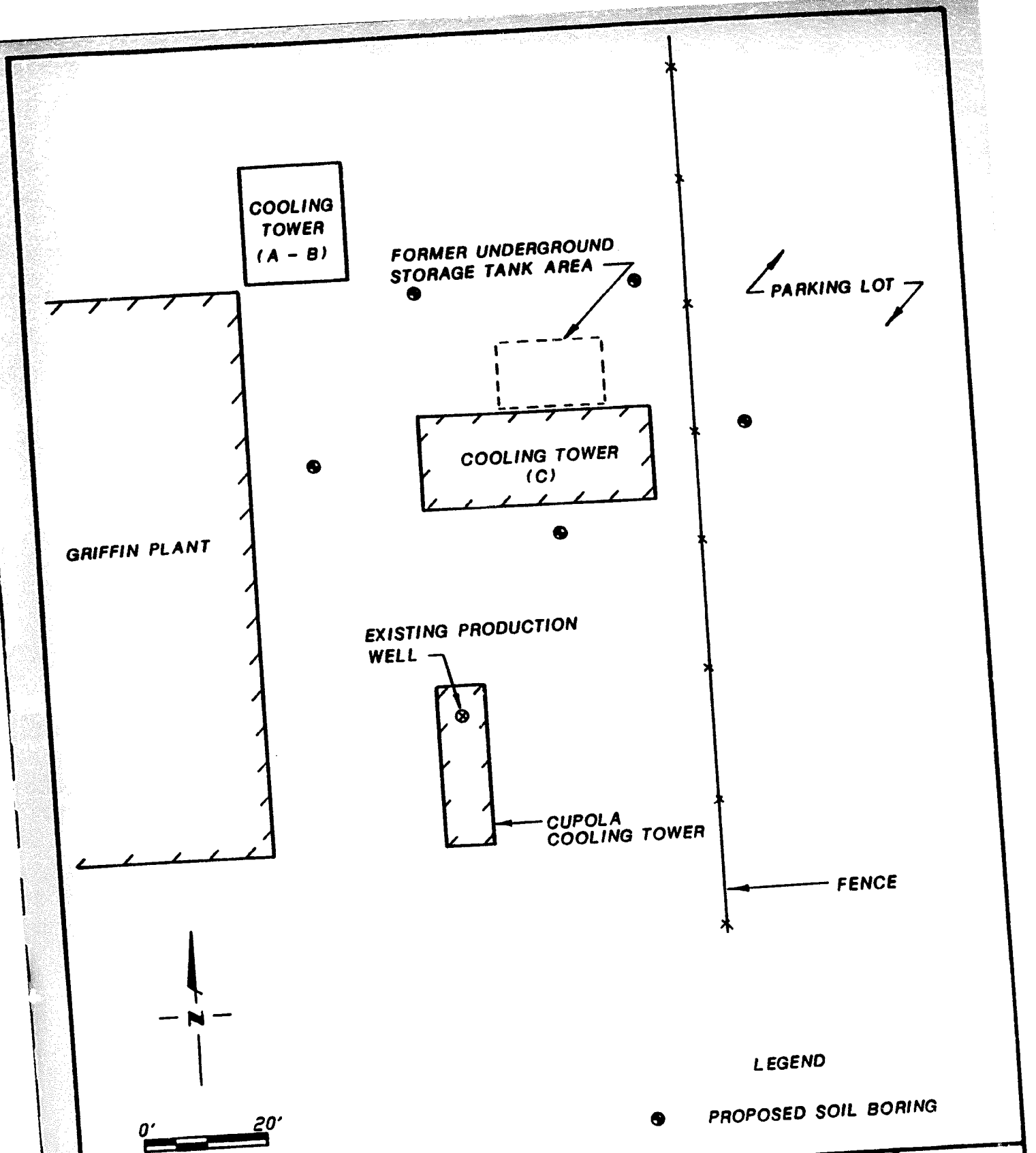
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FIGURE 2-1

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LEGEND

● PROPOSED SOIL BORING

GRIFFIN PIPE PRODUCTS COMPANY	<b>JAMES M. MONTGOMERY</b> CONSULTING ENGINEERS, INC.	JAN., 1990
<b>PROPOSED BORING LOCATION MAP</b>	DES MOINES, IOWA	FIGURE 2-2

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into monitoring wells will be sampled and then backfilled with bentonite and hydrated. Prior to drilling, all underground utilities at the site will be located and recorded. If the proposed placement of a boring threatens to contact any of the identified utilities, JMM personnel on site will relocate the boring in an area which will still yield substantive data.

All wells will be located so as to be easily accessible for sampling and away from heavily traveled and hazardous areas.

### **Well Construction**

The monitoring wells will be drilled using a truck-mounted drill rig and 9 5/8 inch diameter O.D. hollow-stem augers. The monitoring wells will be constructed such that the screened interval intersects the static water table. An effort will be made to screen the wells so that seasonal variations in the elevation of the water table will not result in the wells becoming dry or the surface of the water table rising above the screened interval. Monitoring wells will be constructed with two-inch threaded, flush-mount, No. 10 slot, Schedule 40 PVC well screens and two-inch threaded, flush-mount, Schedule 40 PVC riser pipe.

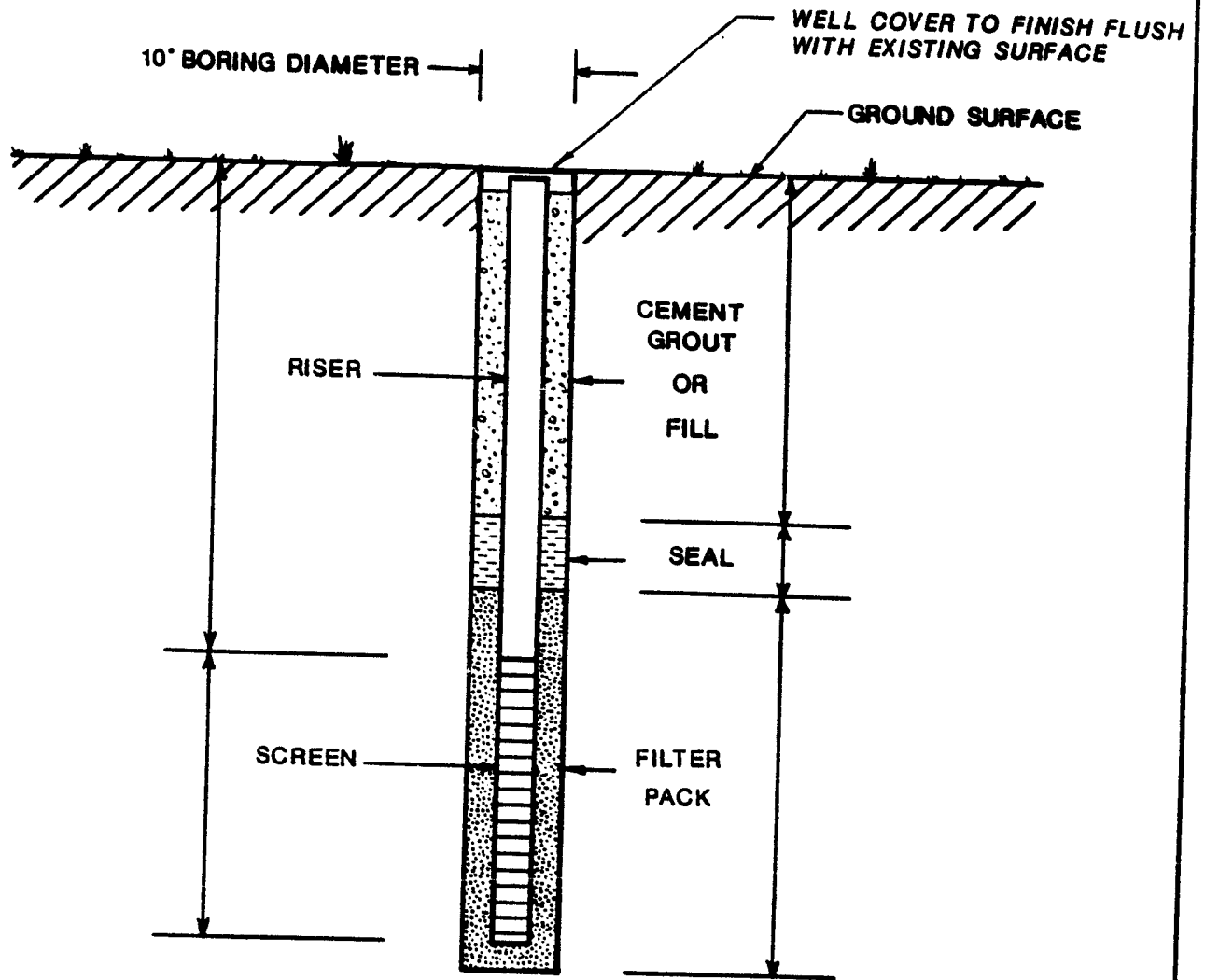
The wells will be placed in the boring and filter sand will be packed around the well screen by adding small amounts of sand to the boring. The sand will be placed to a level approximately one foot above the top of the well screen. Approximately two feet of bentonite pellets will be placed in the annular space above the sand pack and hydrated. A grout mixture of portland cement will then be placed in the annular space to within one foot of the ground surface. Concrete will then be placed in the annular space to the ground surface. A locking, protective, metal cover will be placed over the monitoring wells into the concrete. The cover will be flush with the ground surface to prevent damage from forklift traffic. The metal cover will be equipped with a seal to prevent surface water infiltration into the monitoring well manhole cover. Monitoring well construction details will be recorded in a field log by JMM personnel on site during the installation of the monitoring wells. A typical monitoring well construction detail is presented in Figure 2-3.

### **Well Development**

Monitoring wells will be developed using an air-driven pump or equivalent. The degree of development for each monitoring well will be determined in the field by JMM personnel. In general, the wells will be developed until clear water is being discharged from the pump. The water produced during development will be stored on site pending appropriate disposal. A sample of the contained development water will be collected and sent to NET for analysis of BTXE and total hydrocarbons as mineral spirits. The volume of water pumped will be estimated and recorded in the field log book. The entire pump and discharge line assembly will be decontaminated between wells.

### **Decontamination of Equipment**

All sampling equipment will be decontaminated between samples to prevent possible cross-contamination of samples. Small sampling equipment (i.e., knives, spoons, etc.) will be decontaminated by washing in a mixture of detergent and water followed by rinsing thoroughly with distilled water. Split barrel samplers will be decontaminated between samples using a high temperature, high pressure sprayer. The drilling augers and bits will also be decontaminated



DRAWING NOT TO SCALE

SCREEN: Material SCH 40 PVC  
Slot 0.010"

SEAL: GRANULAR BENTONITE

RISER: Material SCH 40 PVC

FILTER PACK: #1 MUSCATINE SAND

JOINT: THREADED

GRIFFIN PIPE PRODUCTS CO.

MONITORING WELL DETAIL

JAMES M. MONTGOMERY  
CONSULTING ENGINEERS, INC.  
DES MOINES, IOWA

JAN., 1990

FIGURE 2-3

506970

between boreholes using a high temperature, high pressure sprayer. Disposable, surgical gloves will be worn while sampling and logging the soils and will be changed between samples.

### **Survey of Well Locations**

Locations of monitoring wells will be surveyed by JMM personnel to the nearest 0.5 foot using existing features and buildings for horizontal control. Top-of-casing elevations and corresponding groundwater surface elevations will be surveyed to the nearest 0.01 foot using a county, U.S. Geological Survey Bureau (USGSB) or local benchmark. The top-of-casing elevations and static water level elevations will be used to define the subsurface groundwater flow direction at the facility.

### **Site Safety Plan**

A site safety plan will be prepared and made a part of the permanent JMM file for the site. The plan applies to both JMM personnel and its subcontractors. During all field activities, JMM personnel will be on site to act as the health and safety officer(s) for the site work. Work will begin in EPA Level D attire. A decision to upgrade to EPA Level C protective gear, although not anticipated for this site, will rest with JMM personnel and be based on on-site observation or, where applicable, field screening.

## CHAPTER 3

### WATER SAMPLING EQUIPMENT AND PROTOCOL

This chapter provides steps for quality control and quality assurance during groundwater sampling activities.

#### Sampling Containers

Sampling containers for the initial sampling will be obtained from NET. Containers for subsequent sampling events will be obtained from NET or an equally qualified laboratory. Water samples will be placed in those containers supplied by the laboratory.

Sample containers will be labeled with a waterproof pen at the time of collection to prevent sample misidentification. The sample label will include the following information.

- Place of Collection
- Date of Collection
- Sample Identification Number
- Time of Collection

#### Water Level Measurements

Depth to the static water table and depth to floating separated phase contaminants, if any, will be measured at each monitoring well prior to sampling. The measurements will be made using an electronic water/oil interface probe such as an Oil Recovery Systems Interface Probe™ or equivalent. These measurements will be made from the top-of-well casing elevations established during the level survey. The measurements will be made to the nearest 0.01 foot. The wetted portion of the probe will be rinsed with distilled water prior to use in another well.

#### Slug Tests

Slug tests will be conducted in the three monitoring wells to obtain data on hydraulic conductivity of the saturated zone. Approximate yield rates will be determined for each well during development. Groundwater migration velocities will be inferred from this data. The slug test data analysis will be included in the final report.

The slug tool will be decontaminated between each well by washing it in detergent and warm water followed by a distilled water rinse. Disposable, surgical gloves will be worn while conducting the slug test and the gloves will be changed between each well. The slug tool will be attached to a segment of new polypropylene rope for the test. New rope will be used for each well. Care will be taken not to allow the sample tool or rope to contact the ground or other potentially contaminated surfaces.

#### Well Purging

The monitoring wells will be purged prior to sampling to ensure that the sample is representative of the groundwater and does not contain water which has been standing in the well. Wells that

contain free-phase hydrocarbons will not be purged or sampled. In wells without free-phase hydrocarbons, three static well volumes will be removed prior to sample collection. The monitoring wells will be purged using a Teflon™ bailer attached to a segment of new polypropylene rope. Prior to sampling each well, the bailer will be washed thoroughly in a mixture of detergent and warm water and then rinsed with distilled water. New rope will be used on each well. The following calculation will be used to determine the number of bails to be removed from a two-inch diameter well:

$$\# \text{ of bails} = (\text{cross-sectional area})(\text{water column})(7.48 \text{ gal/ft}^3)(\text{bail}/0.25 \text{ gal})(3 \text{ well volumes})$$

Where

- cross-sectional area for a two-inch diameter well is 0.02182 sq. ft.
- length of water column = (total depth of well) - (depth to water)

$$\text{or } \# \text{ of bails} = (1.958 \text{ bails/foot of water column})(\text{length of water column})$$

The following is the log book format to calculate the number of bails to be purged:

Well No.	Total Well Depth from TOC (ft.)	Depth to Water (ft.)	Length of Water Column (ft.)	No. of Bails to be Purged	No. of Bails Actually Purged	Time and Comments
MW-1 thru MW-6						

Disposable, surgical gloves will be worn while purging and care will be taken not to allow the bailer or bailer rope to contact the ground or other potentially contaminated surfaces. If a monitoring well does not yield sufficient water to allow the purging of three well volumes, the well will be bailed to dryness once and will then be sampled as soon as the well recovers. If the recovery time exceeds three hours, the well will be sampled as soon as a sufficient volume of water is available.

### Sample Collection

The samples from the monitoring wells and borings not developed into monitoring wells will be obtained using a Teflon™ bailer and polypropylene rope. The bailer will not be dropped into the water, but slowly lowered into the water to prevent agitation of the sample. The contents of the bailer will be carefully transferred to the sample container. The sampling equipment will not be placed directly on the ground or other potentially contaminated surfaces. Proper decontamination procedures will be followed between sampling events to assure sample integrity. Decontamination will be achieved by washing sampling equipment in a mixture of detergent and warm water followed by a distilled water rinse. Disposable, surgical gloves will be worn while sampling and will be changed between each well.

During each sampling event, one set of field blanks will be collected. The field blanks will be filled on site with distilled water from the same source that is used to rinse the bailers. The filled blank containers will be labeled "Field Blank."

### **Sample Handling**

The samples will be immediately placed in iced coolers to prevent or retard the modification of chemicals in the samples. Samples taken during subfreezing temperatures will be protected from freezing. The sample containers will be packed in the cooler in a manner which will minimize the possibility of breakage. After collection, the samples will be immediately shipped to the laboratory.

### **Sample Documentation**

All sample collection activities will be documented in a bound log book. The log book will contain, at a minimum, the following information.

- Place of Collection
- Sample Identification Number
- Date and Time of Collection
- Total Depth of Well
- Length of Water Columns
- Volume of Water in Well
- Calculation of Three Well Volumes
- Actual Volume of Water Removed
- Type of Sample Container
- Field Observations
- Name of Collector

All samples will be accompanied by a chain of custody form as shown in Appendix A. The sample collector will obtain a signed copy of the chain of custody form prior to relinquishing the samples to the laboratory.

## CHAPTER 4

### ANALYTICAL REQUIREMENTS

Soil and groundwater will be collected and analyzed for the following analytes:

#### Soil

- Benzene
- Toluene
- Xylenes
- Ethylbenzene
- Total Hydrocarbons as Mineral Spirits

Water (borings not converted to monitoring wells and well development water)

- Benzene
- Toluene
- Ethylbenzene
- Total Hydrocarbons as Mineral Spirits

Water (monitoring wells)

- Clean Water Volatiles



## **CHAPTER 5**

### **LABORATORY QUALITY ASSURANCE PROGRAM**

All soil and groundwater samples collected from the Griffin Pipe Products Company facility in Council Bluffs, Iowa, will be analyzed by NET using EPA approved methods as outlined in EPA Manual SW-846. NET conducts all analyses in accordance with a quality assurance/quality control (QA/QC) plan to ensure the accuracy of reported results. A copy of the QA/QC plan can be obtained from NET.

## **CHAPTER 6**

### **ASSESSMENT REPORT**

After completion of the site work, an assessment report will be prepared and submitted to Griffin Pipe Products Company for review and approval prior to submittal to the IDNR for their review and files. The report will address direction of groundwater flow and provide an indication of the magnitude and extent of vertical and horizontal contamination and recommendations for additional site investigation and continued site monitoring and remediation, if required. The following items will also be included in the report.

- As-Built Well Construction Details
- Sampling Procedure Documentation
- Map of Surveyed Sampling Locations
- All Analytical Results
- All Water Level Data
- Groundwater Flow Maps
- Well Boring Logs
- Based on Available Data, Horizontal Soil and Groundwater Contamination Plume Maps
- A Discussion of the Vertical Extent of Soil Contamination
- A Discussion of the Potential for Contamination of Off-Site Groundwater
- Recommendations for Additional Site Investigation or Remediation